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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/526,802	03/07/2005	Yasuhiro Omori	JFE-05-1039	7406

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EXAMINER

YANG, JIE

ART UNIT	PAPER NUMBER
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1709

MAIL DATE	DELIVERY MODE
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07/25/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/526,802

Applicant(s)

OMORI ET AL.

Examiner

Jie Yang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 March 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 March 2005 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>03/07/2005; 06/29/2006</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION***Specification***

The abstract of the disclosure is objected to because the abstract should be in narrative form and generally limited to a single paragraph within the range of 50 to 150 words. The abstract should not exceed 15 line of text. Correction is required. See MPEP § 608.01(b).

The equation (1) used in instant application cannot give out "LD value" in table 1. Examiner compared present application with certified copy of foreign priority application document submitted by 371 application and found: there is no "}" behind "...7.98x(C)" in certified copy document. Proper corrections are needed to all the equation (1) (in claim 1; abstract; page 6, page13) recited in present application.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-3 are rejected under 35 U.S.C. 112, second paragraph, The LD in claims contains a typing error with respect of equation (1). See specification above. For examining purpose, the interpretation of LD is as following (refer to certified copy of foreign priority application document:

$$LD = 0.569 \times \{7.98 \times (C)^{1/2} \times (1+4.1Mn)(1+2.83P)(1-0.62S)(1+0.64Si) \\ (1+2.33Cr)(1+0.52Ni)(1+3.14Mo)(1+0.27Cu)(1+1.5(0.9-C))\} + 52.6$$

— (1)

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3 are rejected under 35 U.S.C. 102(b) as being anticipated by Matsuzaki et al (JP 09111401, thereafter 'JP401).

Regard to claim 1, 'JP401 teaches a steel for machine structure use having high torsional strength after induction hardening and tempering and excellent in machinability and quenching crack resistance (Abstract of 'JP401). The composition range of steel claimed in 'JP401 significantly overlaps the range of alloy recited in instant claims. Especially, the LD value of test samples, for example #9, in table 1 of the 'JP401 meet the limitation of equation (1). Regard to the equation (1), it is well settled that there is no invention in the discovery of a general formula if it covers a composition described in the prior art, In re Cooper and Foley 1943 C.D.357, 553 O.G.177; 57 USPQ 117, Taklatwalla v.Marburg. 620 O.G.685, 1949 C.D.77, and In re Pilling, 403 O.G.513, 44 F(2) 878, 1931 C.D.75. In the absence of evidence to the contrary, the selection of the proportions of elements would appear

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to require no more than routine investigation by those ordinary skilled in the art. In re Austin, et al., 149 USPQ 685, 688. 'JP401 got same microstructure (Table 2 of 'JP401) as disclosed in instant invention (Table 2 of instant application). As alloy of 'JP401 has same alloy composition range and same microstructure as instant invention, specific properties, such as formability of rotary-forming, quenching crack resistance, and torsional properties can be inherently obtained (Refer to MPEP 2112.01 [03] I). Claim 1 is anticipated by 'JP401.

Element	From instant Claims (in wt%)	'688 (in wt%)	Overlapping range (in wt%)
C	0.35-0.50	0.35-0.60	0.38-0.45
Si	0.15 or less	0.05 or less	0.05 or less
Mn	0.20-1.1	0.67-1.7	0.67-1.1
P	0.02 or less	0.02 or less	0.02 or less
S	0.005-0.035	0.005-0.035	0.005-0.035
Cr	0.1-0.2	0.15 or less	0.1-0.15
Mo	0.05-0.5	0.05-0.5	0.05-0.5
Ti	0.01-0.05	0.01-0.05	0.01-0.05
Al	0.01-0.05	0.01-0.05	0.01-0.05
N	0.01 or less	0.01 or less	0.01 or less

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B	0.0005-0.0050	0.0005-0.0050	0.0005-0.0050
Cu	0.06-0.25	1.0 or less	0.06-0.25
Ni	0.05-0.2	3.5 or less	0.05-0.2
V	0.01-0.3 (Cl.2)	0.01-0.30	0.01-0.30
Nb	0.005-0.05 (Cl.2)	0.005-0.05	0.005-0.05
Fe	Balance	Balance	Balance

Regard to claim 2, 'JP teaches V:0.01-0.3% and Nb: 0.005-0.050% (Abstract of 'JP401). Claim 2 is anticipated by 'JP401.

Regard to claim 3, as discussed in rejection for claim 1, 'JP401 teaches induction hardening and tempering process to treat the alloy and 'JP401 also teaches drive shaft application for mechanical structure alloy ('JP401 translation, [002] Description of the prior art). Claim 3 is anticipated by 'JP401.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

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1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Isokawa et al (US 5,279,688, thereafter '688)

Regard to claim 1, '688 relates to a steel shaft material having desirable cuttability and induction hardenability with composition range significantly overlaps the range of alloy recited in instant claims (Abstract of '688 and refer to the following composition comparing table). Especially, the LD value of test samples, for example #9, in table 1 of the '688 meets the limitation of equation (1). Regard to the equation (1), it is well settled that there is no invention in the discovery of a general formula if it covers a composition described in the prior art, In re Cooper and Foley 1943 C.D.357, 553 O.G.177; 57 USPQ 117, Taklatwalla v. Marburg. 620 O.G.685, 1949 C.D.77, and In re Pilling, 403 O.G.513, 44 F(2) 878, 1931 C.D.75. In the absence of evidence to the contrary, the selection of the proportions of elements would appear to require no more than routine investigation by those ordinary skilled in the art. In re Austin, et al., 149 USPQ 685, 688.

The examiner notes that the compositions and treatment temperature disclosed by '688 overlap the compositions of the instant invention, which is a prima facie case of obviousness. See MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art to select the

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claimed compositions disclosed by '688 because '688 disclose the same utility throughout the disclosed ranges.

Compared with instant invention, the alloy of '688 has overlapped alloy composition range and similar heat treatment process as discussed, specific properties, such as formability of rotary-forming, quenching-crack resistance, and torsional properties, can be inherently obtained (Refer to MPEP 2112.01 [03] I). Claim 1 is rendered obvious by above references.

Element	From instant Claims (in wt%)	'688 (in wt%)	Overlapping range (in wt%)
C	0.35-0.50	0.38-0.45	0.38-0.45
Si	0.15 or less	0.15 or less	0.15 or less
Mn	0.20-1.1	0.3-1.0	0.3-1.0
P	0.02 or less	0.013-0.022	0.013-0.02
S	0.005-0.035	0.005-0.3	0.005-0.035
Cr	0.1-0.2	0.3 or less	0.1-0.2
Mo	0.05-0.5	0.10 or less	0.05-0.10
Ti	0.01-0.05	0.01-0.05	0.01-0.05
Al	0.01-0.05	0.01-0.06	0.01-0.05
N	0.01 or less	0.01 or less	0.01 or less

B	0.0005-0.0050	0.0005-0.0030	0.0005-0.0030
Cu	0.06-0.25	00.3 or less	0.06-0.25
Ni	0.05-0.2	0.25 or less	0.05-0.2
V	0.01-0.3 (Cl.2)	--	--
Nb	0.005-0.05 (Cl.2)	--	--
Fe	Balance	Balance	Balance

Claims 2, 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Isokawa et al '688 in view of Ochi et al (US 6,660,105 B1, thereafter '105).

Regard to claim 2, which depended on claim 1, '688 and '105 teach the limitation of claim 1, but primary reference '688 does not explicitly teach adding V and Nb in the alloy as claimed in instant application. '105 teaches adding 0.022-0.04% Nb and 0.03-0.5% V in hot rolled case hardening steel. These composition ranges overlap that claimed in instant claim. '105 also points out: "during carburization heating Nb bond with C and N in the steel to form Nb(C,N), refining the grain, and it is also effective for suppressing grain coarsening..." (Col.6, Line 13-34); and "V is another element that is effective for imparting strength and hardenability to the steel..." (Col.7, Line33-40). Therefore, it would have been obvious to one of ordinary skill in the art to choose suitable amount of Nb and V as demonstrated in '105 in the process of '688. Claim 2 is rendered obvious by above references.

Regard to claim 3, which depended on claim 1. '688 and teaches the limitation of claim 1. But '688 does not

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explicitly teach tempering process. '105 teaches a case hardening steel having good coarsening properties during carburization (Col.1, Line 10-14). The composition range of '105's alloy significantly overlaps the composition range of alloy recited in instant claim (abstract; claim 1,5,8; and table 1 of '105). '105 teaches after induction hardening and tempering, the tempering was carried out using a temperature of 180°C for two hours (Col.14, line 10-41). '105 also teaches drive shaft application for mechanical structure alloy.

The examiner notes that the compositions disclosed by '105 overlap the compositions of the instant invention and '105 also discloses induction hardening and tempering treatment as recited in instant claim, which is a prima facie case of obviousness. See MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art to select the claimed compositions and induction plus tempering treatment disclosed by '105 in the process of '688 to improve rolling fatigue life of the parts (example 5-6; Col.11, line 15-34 of '105). Claim 3 is rendered obvious by above references.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jie Yang whose telephone number is 571-270-1884. The examiner can normally be reached on M-F, 7:30-5:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Cleveland can be reached on 571-272-1418.

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The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JY



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SUPERVISORY PATENT EXAMINER